Hobbies WEEKLY

CONTENTS

August 23rd, 1950 Price Fourpence Vol. 110 No. 2860

An easy-to-build elastic driven

MODEL SPEED BOAT

THE thick square-sectioned elastic sold for model aircraft-making can also be used to drive a model boat. An elastic motor can be fixed to almost any type of hull, but it is best suited to the ordinary shallow draught speed boat. The model described below will run for several minutes, and is certainly a simple enough model to make.

Light Hull

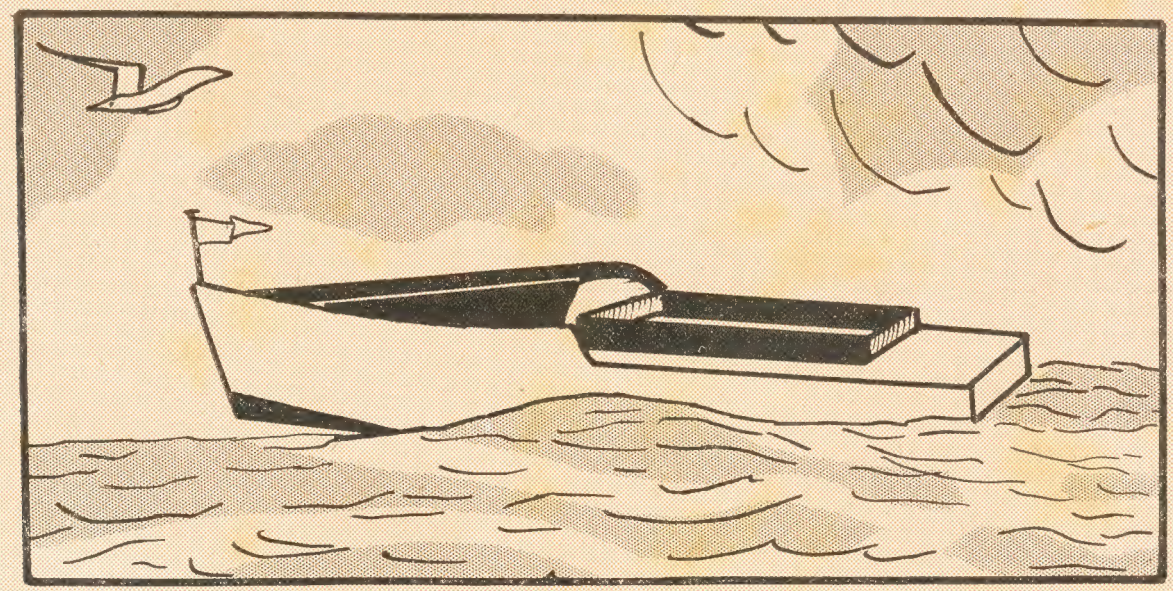
The hull could be carved from a solid block of yellow pine or balsa, but in both cases it would be necessary to spend a considerable time in hollowing out the hull. For a combination of lightness and economy in wood it is preferable to make the hull on the 'built-up' principle.

The base and deck piece are each cut from a piece of ¼in. thick wood measuring 1ft. 3ins. long by 4ins. wide. The shape of these is shown at Fig. 1, and it will be seen that from the bow the side curves out gradually to its maximum width at 8ins. from the tip, and then falls back gradually to the stern which is 2ins. long.

To make certain of getting the correct shape it is advisable to draw the outline on a piece of paper and to paste this to the wood in the manner of a fretwork pattern. The two pieces of wood can be sawn at the one time if they are tacked together temporarily. The cockpit opening (measuring 6¼ins. by 1⅜ins., and which is also shown on the drawing) is cut out with the fretsaw on the deck piece only.

Bow and Stern Blocks

The edges of the base and deck are thoroughly glasspapered, and they are then fastened together at bow and stern by two shaped blocks ⅜in. wide, the bow block being 1¼ins. and the stern block



$\frac{3}{4}$in. deep. These blocks are shaped to fit flush with the edges of the base and deck, and are glued and nailed into place. A view of the partly assembled boat at this stage is given at Fig. 2.

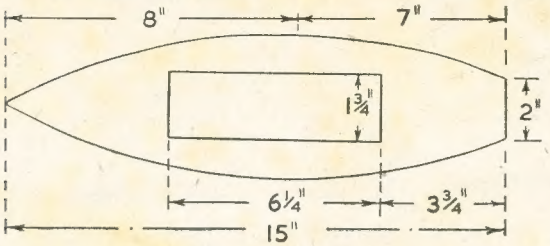


Fig. 1—Plan of bottom and deck


Fig. 2—Showing hull construction

The essential measurements of the sides (which are of $\frac{1}{16}$in. plywood) are shown at Fig. 3, though the drawing is not true to scale. After being cut to shape and glasspapered, they are fixed round the hull with glue and very fine brass nails, their lower edge being kept flush with the bottom of the base.

When the glue has dried the entire hull should be glasspapered and then made watertight by being given a coat of red lead both inside and out, followed by two coats of ordinary enamel.

A $\frac{1}{2}$in. wide strip of $\frac{1}{16}$in. plywood is fastened round the inside of the cockpit opening, flush with the bottom edge of the deck piece. This lining strip should not be enamelled, but should be stained and lightly polished with furniture cream.

The Propelling Mechanism

Two pieces of fairly stout strip brass $\frac{1}{2}$in. wide will be needed for the brackets, one piece being 3$\frac{1}{4}$ins. and the other 5$\frac{1}{2}$ins. long. The shapes to which these must be bent are shown at Fig. 4, with a sketch of their finished appearance. The bending of the brass will be found quite a simple matter if a shallow cut is made with a file on the inside of the bend. Holes for the small fixing screws and for the hooks that hold the elastic must be drilled in the brackets. These have been shown on the drawings by means of small black circles.

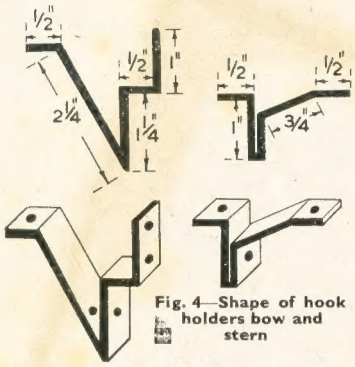


Fig. 4—Shape of hook holders bow and stern

The brackets must then be screwed into place, using two screws on the bow bracket and three on the stern. They should be carefully positioned and the holes pre-drilled for the screws. Their position is shown on the section of the boat given at Fig. 5.

The hooks between which the elastic is stretched are made from stout brass wire. A fairly large loop is made at one end of each piece of wire, then the bow hook is passed through the holes at the bottom of the bow bracket and is burred over on the end to keep it in place.

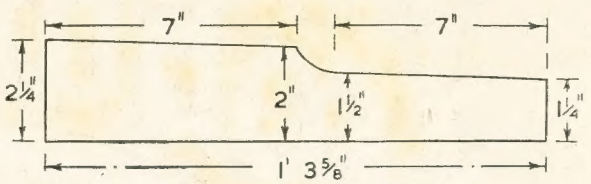


Fig. 3—Dimensions and shape of side pieces

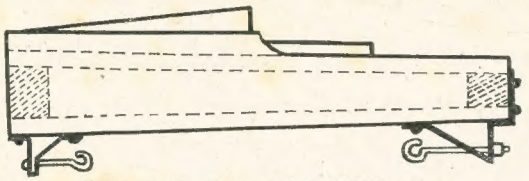


Fig. 5—Sectional view with driving hooks

Before fixing the stern hook the propeller should be prepared. This is cut from a piece of thin brass or tin measuring 1$\frac{1}{4}$ins. high by $\frac{1}{8}$in. wide, its shape being shown at Fig. 6. The propeller is given a slight 'pitch' by twisting it throughout its length so that as it spins round the vanes strike the water at an angle to the centre line of the hull. Or you can purchase a propeller ready made and shaped.

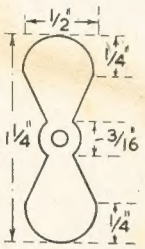


Fig. 6—Propeller size and shape

If possible, the propeller should be soldered into place. To do this a short brass sleeve is soldered to the propeller, then the sleeve is slipped over the shaft and soldered there. It is also a very good idea to thread a small glass bead over the shaft between the propeller and the stern bracket, as this will minimize the friction there.

Model aeroplane elastic, $\frac{1}{8}$in. wide and $\frac{1}{32}$in. thick, should be used for the motor. Six strands of this will be needed, all strands being looped between the brass hooks beneath the boat. To keep the elastic in good condition it should be wiped over with glycerine, this treatment being repeated at weekly intervals.

This completes the speed boat, but a rapid-winding device can be made by soldering a small hook into the end of an egg-whisk. The hook has simply to be slipped between the rubber bands and the handle of the egg-whisk turned to wind the rubber motor. (235)

Painting

WHAT is the best type of paint for painting galvanized iron on outhouses? Also how may I treat boarded floors on the ground floor to keep them from rotting under linoleum? (C.M.—Co. Cavan).

YOU can paint galvanized iron with a special paint made for the purpose. Enquire at your local dealers. If not obtainable, remove rust with a scratch brush, wash over with weak muriatic acid to provide a grip for the paint, and then paint with a good quality outdoor paint of the usual kind. The boarded floor should be thoroughly cleaned and coated with creosote before the linoleum is laid. Before coating a damp wall with distemper, remove all the old lime wash, and when as dry as possible, coat the wall with Granger's solution.

* * *

Smoke Ejector

WOULD you tell me what kind of material I could use which would slowly smoulder and emit a fairly slow smoke? (J.C.—Dun Laoghaire).

WE suggest you experiment with narrow lamp wick soaked in lubricating oil, the surplus wiped off or wrung out, and then steeped in saltpetre. When dry, this should act in the manner of a slow match and emit quite an amount of smoke.

* * *

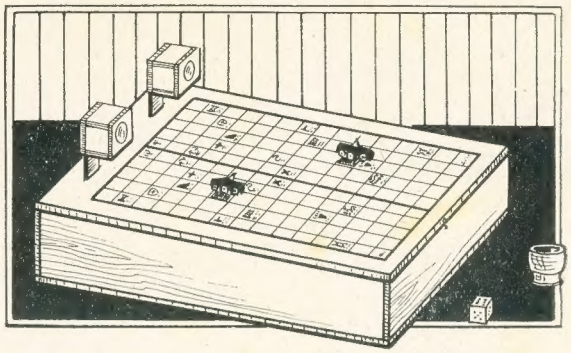
Model Aeroplane Dope

I HAVE purchased an aeroplane constructional kit, and I would be obliged if you would tell me how and why dope is used. (N.H.—Co. Cork).

DOPE is used to stiffen the fabric to cover the wings of the aeroplane, and cause it to resist the pressure of the air currents which otherwise would tend to retard a successful flight. It can be applied either with a brush or by spraying.

See the motorist light the signals in this novel

ELECTRIC RACE GAME



WE have no doubt that many readers are connected in one way or another with the various activities to reduce the high accident rate on our roads. For them the electrical race game shown here will have an added attraction. Of straightforward construction, it embodies an interesting wiring system which automatically operates red lights at certain points round the track.

It is arranged for two players, and as their mascot cars race each other round the board they encounter squares marked with the danger signs similar to those we meet on the road, and which it is now the duty of all of us to observe more fully.

When a player's car alights on one of these squares his red 'stop' light comes into operation. There he must stay until he throws a 'road clear' reading on the specially adapted dice, whilst his opponent races ahead until he too gets similarly held up.

The Principle

The playing board forms the lid of a shallow case, into which all the parts go when not in use. This board is ruled into two sets of 1in. squares, and each player moves his car round his half of the board according to the number he throws at his turn with the dice. The player who completes his journey first wins the game, but the obstacles are so placed that it is difficult to say who the winner will be until the game is finished.

Two flat-headed screws are fixed through the board in each of the danger squares, with their heads just flush with the playing surface. These screws are wired into the two circuits in such a way that when both of any pair are joined, one of the circuits is closed and one bulb lights up.

The model cars are fitted with metal bases which can close this gap and so light up the player's 'stop' light if the luck of the dice causes him to alight on one of these squares.

Materials Required

Plywood is best if available, though stout cardboard reinforced at the corners can be used if preferred. The dimensions and the wiring given allow for a board measuring 18ins. by 12ins., with 75 one-inch squares to each half of the board, twelve of each half being fixed into the wiring circuit.

These dimensions can, of course, be varied to suit the reader's own preference—the principle of the lighting remains the same. Care should be taken, however, to ensure that both halves of the board are kept identical, so one does not become easier to play on than the other.

In addition to plywood for case, lamp standards and mascots, the only other requirements are the torch battery and two bulbs, two small pieces of lead for the base of the cars, and a few feet of copper wire. An ordinary dice and shaking-up box can be procured from any fancy goods shop, or easily made up by the handyman if preferred.

Bare copper wire may be used if care is taken to ensure it does not touch any adjacent strand. This, naturally, makes the wiring-up easier, since it can be quickly twisted round each screw and carried on to the next.

Case Construction

Fig. 1 shows the constructional details of the case. The lid is hinged to one end, and inside the case three pieces are screwed to the base to form a holder for the torch battery. Two slits each 1in. long are cut in the lid, as shown, into which the lamp standards fit.

When in position these lamp standards project down through the lid and touch the bottom of the case. The width of the slits in the board will, therefore, need to be the thickness of the wood forming the lamp standards, plus a clearance for the lamp wires which run down the back of the standards, as shown at Fig. 5.

The Board

The detail at Fig. 2 shows the board ruled up in 1in. squares, and the position

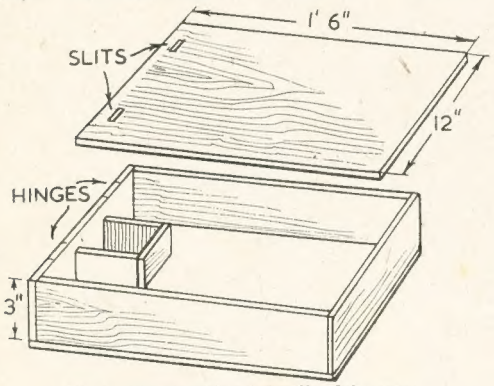


Fig. 1—Constructional details of the case

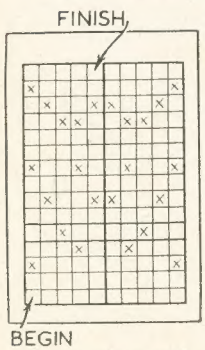


Fig. 2—The board

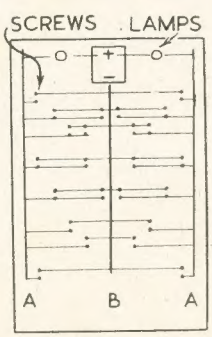


Fig. 3—The wiring

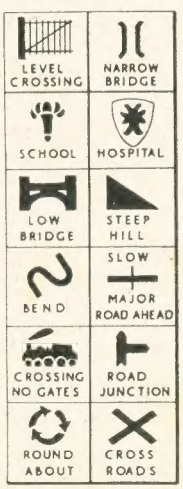


Fig. 4—The obstacles

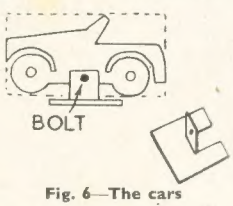


Fig. 6—The cars

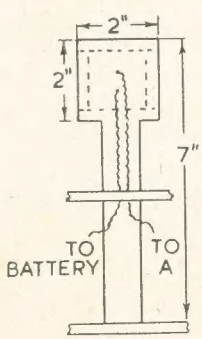


Fig. 5—Lamp wiring, back and side view

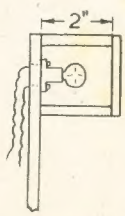


Fig 7—The dice

of the 'danger' squares. The ruling can be done on to a sheet of white paper which is then glued to the board, or drawn direct on to the board itself.

Suggested 'stop' signs for the squares are given at Fig. 4. They can be drawn on to paper with paint or indian ink and glued to the squares, or painted on to the board direct as in the case of the lines. One square is marked for the beginning on each half of the board, and the last square in each marked with a winning post.

The Lamps

The lamps are housed in two small wooden boxes, as shown at Fig. 5. It will be seen that the back is cut narrower outside the lamps, and then forms the lamp standard, which fits through the slits cut in the board. A flash-bulb holder is screwed to the back of each lamp, and the fronts of the lamp boxes are fretted with a hole 1½ins. diameter, covered with red paper or celluloid.

The Wiring

Put two screws through the board in each of the 'danger' squares and countersink them just sufficiently for their heads to be left flush with the top. Each pair should be about ½in. apart, so they can be easily covered by the metal bases of the cars. Fig. 3 shows how the screws are wired-up into two circuits, on the underneath side of the board.

One terminal of the battery is wired to both lamps and the other terminal on each lamp is connected to the master wire running down the two outside lengths of the board (marked A).

The other terminal of the battery is connected direct with the other master wire running down the centre of the board and marked (B). It is best to fasten these principal wires down first, by means of short staples at each end.

To complete the wiring, the lower of each pair of screws is joined to the nearest (A) lead, and the upper of each pair to the centre (B) lead. In a number of cases one piece of wire will link up several screws, as shown. If it is decided to make the lamps collapsible, for storing in the case when not in use, it is necessary to have breaking points in the wires, underneath the board, and the wires from battery to lamps must be left long enough to allow for this.

Alternatively, the lamp standards can be left up permanently. In which case the wires can be tighter and require no joints, but sufficient allowance must still be left on the leads to permit the lid to open and close without breaking the connections.

CUTTING LIST

(for wood of ¼in. thickness)

No. of pieces	Size	Description
2	18ins. × 12ins.	Lid and Base of Case
2	17½ins. × 3ins.	Sides of Case
2	12ins. × 3ins.	Ends of Case
2	7ins. × 2ins.	Back of Lamp Standards
2	2ins. × 2ins.	Front of Lamp Standards
4	2ins. × 1½ins.	Sides of Lamp Standards
4	2ins. × 2ins.	Top and Bottom of Lamp Standards

The Model Cars

An outline for the two little race cars is given at Fig. 6, but readers who have one or more favourite makes of their own will, no doubt, have pictures of these that they prefer to copy. Cut them out in fretwood and finish off smoothly with glasspaper. Then take the piece of lead, hammer it out flat and cut it to a rectangle about 1in. square.

Make two incisions about ⅜in. apart and bend up the centre piece to a rightangle, as shown at Fig. 6. Then fasten the wooden mascot to this base with a small nut and bolt, and finish off with bright coloured enamel or paint.

The Dice

If a bought dice is used it needs a little adapting for this game. Glasspaper or file off the dots on one surface (say, the two) and in its place paint the words 'Road Clear' (see Fig. 7). Alternatively a dice can be made from any little cube of hardwood, and then the dots and the 'Road Clear' reading can all be painted on to match. Finish off the case with stain or paint, and add a small fastener to the lid.

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The Craftsman's Notes —

Plain Pleasures

COMMENTING on the changes that have taken place, a countryman went on to tell me how they used to make their own entertainment when his village was really remote—before the days of all these modern amenities, like wireless and cinemas and buses.

He recalled the skill of one chap at local concerts and inns with paper. He would fold up a sheet of paper, snip at it here and there with his fingers, then open it out again to reveal an artistic design as pleasing and intricate as a piece of lace.

Others were fond of whittling, and after the day's work would sit in the evening sunshine carving fancy shapes. One chap specialised in making fans, which looked colourful as well as ornamental after he threaded them with bright wool. These craftsmen with a penknife worked not only in wood, but on such out-of-the-ordinary material as a turnip, converting it into a shapely flower or face.

They were never lost for music at their gay evening gatherings, always quick to improvise. The concertina or fiddle would be a main feature of the band, with mouth organs, jew's harps, and tin whistles in strong support. Improvising amateurs would probably also add their bit with comb and tissue—a strip of tissue paper along the teeth of a comb held to the lips.

* * *

Weather Lore

IT is good to see a splendid red sunset the evening before we are to set out on a ramble, for as most of us know, it portends good weather—'Red Sky at Night Sailor's delight' as the saying goes. A red sky in the morning, on the other hand, is considered unfavourable.

These natural weather signs are certainly interesting to know, so here are a few others: though, of course, they are not to be taken as infallible guides to the state of the weather ahead.

A grey sky in the morning, swallows flying high, heavy dew, soft delicate clouds, and sea birds flying far out to sea early in the morning, are all said to be signs of good weather. Then there is the old saying that if it rains before Seven, it will be fine before Eleven.

As for the approach of bad weather, well, swallows are supposed to anticipate this by flying low. So do sea birds flying inland, and animals in the fields seeking shelter. A bright yellow sky at sunset may mean wind to follow, whereas a pale watery sky may mean rain. Unusual clearness of distant sounds is also said to be an indication of bad weather, but—to end on an optimistic note—when rooks build high in the trees the summer as a whole is likely to be good.

* * *

Corrugated Paper for Models

ODDMENTS of strong corrugated paper and cardboard can at times come in quite useful to the model maker, and a small supply kept on hand in the workbox may prove just the means of helping one out of some little difficulty or adding a realistic finishing touch to a piece of work. Here are a few suggestions as to possible uses.

Wrapped around wood or cardboard posts, with the ridges vertical, good ornamental posts or pillars can be obtained for porches at the entrance to houses and other buildings. It also does well for fencing around miniature gardens and railway stations, and is worth considering for model garages and outbuildings where the appearance of a corrugated iron roof is required.

Useful pieces of the material can often be obtained from the wrappings in which electric lamps and various kinds of bottled foodstuffs are sold.

The Craftsman

How to fit your doors and windows with BURGLAR GUARDS

SHOULD you have had any burglars in your district (or even if you have not) it is good to take extra precautions against intrusions of this sort when you go away on your holidays. It is quite impossible to safeguard your house against highly-skilled thieves, but these seldom work private houses, and the kind of sneak-thief you are most likely to encounter is the type who will be quite put off by a window that absolutely refuses to open or a lock that just will not be picked.

Sash Windows

To secure windows of the sash type the best thing is to bore a fine hole through the one sash and partly into the other where they overlap. Into this is run a long, narrow screw (as Fig. 1) with the head countersunk. A large nail would do equally well, but there is always the chance of this being shaken out. With this method of securing, even if the thief breaks a pane it is a thousand to one his discovering what is still holding the frame.

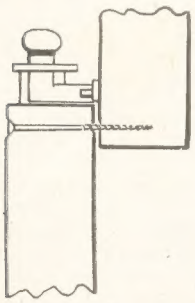


Fig. 1—Section of sash with screw through

Lattice windows cannot be so readily dealt with, but can be secured with a screw against the haft of the catch so it cannot be turned up by a knife from the outside. A screw through one of the holes of the adjusting bar makes things double sure.

Door Locks

With regard to doors. Keys should be left in the locks but given a half-turn, so the projections at the end are lying inside the lock. A piece of stiff wire or a short bar of metal is then run through the ring at the end and secured in any convenient way (Fig. 2).

Thus the key cannot be pushed right out as its end is caught up on the inside of the lock, neither can it be turned on account of the wire. A lock so prepared will stop any but the most determined house-breaker. In the combined 'lock and knob' type of door fastener the guard wire can readily be taken round the shank of the knob.

Should the door have bolts also, these can be made secure by a well-placed screw. The bolt is pushed home and its end then pushed up or down as convenient and a screw driven home beside it. This will prevent the end coming forward by any manipulation on the main shank.

Letter Boxes

Letter-boxes in front doors should receive attention and be temporarily covered with, say, a wire grating. If you have one of those letter baskets or other type of 'catcher' fitted, this, of course, will serve the purpose of a guard.

While looking round before locking up, give a general eye to all things like garden and backyard door hinges, latches and the like and reinforce where necessary. While looking all right, these items out in the open have a knack of corroding, when they would come away whole with a steady pressure from the outside.

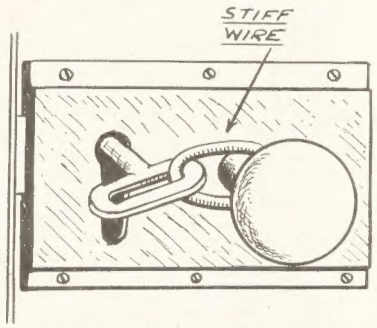


Fig. 2—Key and handle lock

Small Windows

A house-breaker often attempts to make an entry through some small little-noticed window, as, say, the type fitted to pantries in the newer properties. These should receive especial attention. Often in large property this type of window is fitted with bars to circumvent marauders.

It is, of course, not a hard job to fit a bar across any small really tempting ground-level window. The ends of a softish metal bar, which any blacksmith would supply, are bent to right angles and then given a slight turn out. These ends are then set fairly deeply into prepared openings between bricks and surrounded by cement.

Alarm Bell

You will probably have some arrangement with the people next door to keep an eye on your house while it is empty, but if you wish it is not hard to fit up a burglar alarm which will ring if any important door is opened and which in smaller property would readily be heard through a dividing wall. The main point about an alarm of this sort is that it must ring continuously once started.

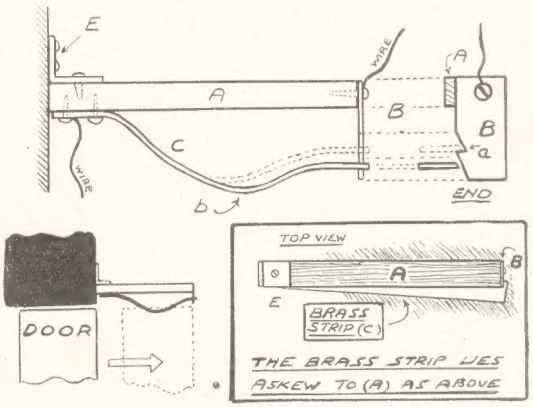


Fig. 3—The catch and fitting for an alarm bell

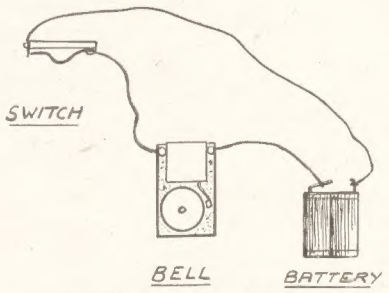


Fig. 4—The bell wiring of an alarm

To this end the special switch as shown is made. The rest of the circuit is simple, because for a front door bell, the wire is being taken to the terminal of a bell and cycle lamp battery, as indicated.

The special switch (Fig. 3), which is secured to the top of the jamb by a simple bracket (E) is composed of the pieces of wood (A) and the two pieces of strip brass (B) and (C). The first is attached to the end of the wood and is slightly notched as (a). The second piece (C) is long and bent and lies slightly askew to the wood as indicated.

When anyone enters the room the top of the door pushes against the loop (b) which causes the end to slip over the notch. The circuit is closed, of course, when the piece (C) touches (B) and the bell rings, and continual contact is maintained by the end of (C) slipping into the notch.

This is a very simple and effective switch of its kind. The circuit of the bell wiring is shown at Fig. 4.

None of the precautions above take very long—indeed a much shorter time than they take to describe. So the handyman of the home should get busy just before going away. A much happier holiday will be spent by all if you know that everything is really secure. (226)

Hours of amusement from an old box turned into

A CHILD'S TOY SHOP

HERE is something to amuse the children. It can be made in a few hours, and will give a great deal of pleasure to the fortunate girl or boy who possesses it. The materials used are cheap, and the entire shop and fittings, together with the electric lighting system, should cost only a few shillings.

First obtain a box 19½ins. by 12ins., with a depth of 10½ins. (The writer got an apple box this size from the greengrocer, and paid 3d. for it). Take the lid from the top, knock out the bottom, and place the box on its side.

The wood taken from the bottom is used to form the roof, which is strengthened by placing two 1in. strips of wood down each side. These strips are 9½ins. long. Then get two hinges, and use them to fix the roof to the top front edge of the box.

Roof Front

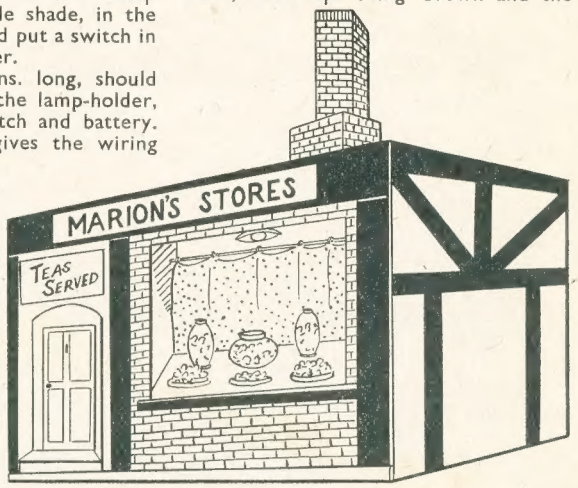
When this roof or lid is let down, it should cover the front of the shop leaving 1in. opening at the bottom. Next, nail a wooden strip 1in. by 19½ins. along the bottom to fill this gap (Fig. 1).

For the chimney, the wood should be 1½ins. square, and 9½ins. long. Fix it to the top of the box with two screws. Place a cycle lamp battery in front of this chimney, and enclose the battery in a box made with four pieces of wood, each 4½ins. by 4ins. Screw the box to the chimney (Fig. 1).

Next, place a small electric lamp holder, with home-made shade, in the centre of the ceiling, and put a switch in the top right-hand corner.

A piece of flex, 24ins. long, should then be connected to the lamp-holder, and carried to the switch and battery. The detail at Fig. 2 gives the wiring diagram). Fix the flex to the ceiling with staples.

A curtain, 18ins. by 8ins. is placed at the back of the shop. Six 1in. rings should be sewn to the top of it, and these should run on a ½in. rod, measuring 18ins. This rod must be nailed at both ends to keep it in position (Fig. 3).



The Shelving

For the shelves, use wood ½in. thick. Take a piece 17½ins. by 5½ins., and on this in a central position (leaving a space of 3ins. at each end) at right angles nail another piece 11½ins. by 6ins. On this base nail a shelf 9½ins. by 2½ins., standing on supports 2ins. by 1½ins. (Fig. 4).

The two side shelves measure 6ins. by 3ins., with a raised portion 3ins. by 3ins., as seen in Fig. 5.

Decorate the two ends of the box, gable style, with ½in. wooden strips, as can be seen in the photograph of the finished article.

Take out the shelves before painting the shop, also the curtain. The interior should be white, with cream around the outer edges. Cream is also used for the two ends, the strips being brown and the shelves white.

Open the lid, and, leaning it against the chimney, paint the roof red. When dry, use a small camel hair brush, and draw lines in indian ink to represent tiles. The chimney and the box covering the battery, are also painted red, and they are finished off with the ink in narrower lines, to produce a brick-like effect. Paint the top of the box red.

Painted Front

When dry, bring down the lid, and glue to it a piece of cardboard 19½ins. by 11ins. On this cardboard sketch a door and a window, using poster paints. The child's name, together with the word 'Stores', is placed above the door and window.

Empty meat jars, with the screw caps painted red, blue, or yellow, can be used for the sweets and any other delicacies that you can manage to procure. A helpful suggestion for the shop is shown by the picture of the interior.

The shop is now ready to be handed over to the shopkeeper, and you may be sure that this important little person will take a special delight in serving you with goods. (160)

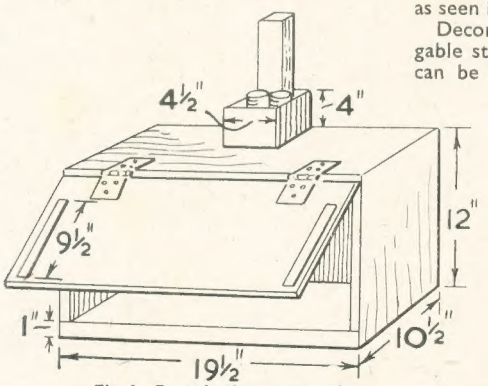


Fig. 1—Parts in the construction

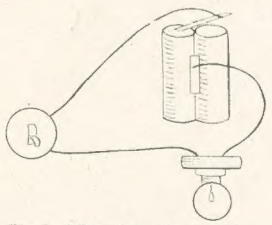


Fig. 2—The wiring for lighting

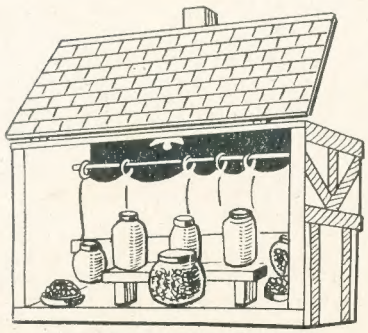


Fig. 3—Suggested interior work

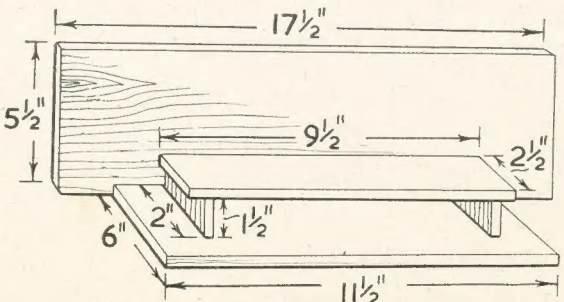


Fig. 4—The display counter for the inside

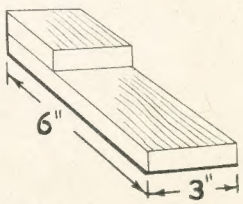


Fig. 5—The side shelves

For fitting into a small hull, make this

REVERSIBLE BOAT MOTOR

THIS motor is long and quite narrow and can accordingly be fixed in a model motor boat, together with a suitable dry battery. It can also be used for driving other models, of course, and it may be reversed by simply altering the polarity of the supply—that is, changing round the battery connections.

The armature is especially easy to build and none of the constructional details is in any way critical, though the motor will run efficiently at high speed.

Magnet and Bearings

It may be desired to make use of a magnet already to hand and the sizes of the other parts can be arranged accordingly. A magnet about 1½ins. between the poles is, perhaps, the most suitable for a small motor.

A baseboard about 1in. by 2½ins. is cut from ¼in. thick wood and the magnet is secured to this by a square of wood which passes over the pole resting on the base, and is held by four screws. Figs. 1 and 2 show this. So this cross-piece of wood may provide a firm mounting for the one bearing two small strips the same thickness as the magnet pole are placed each side (see Fig. 1).

The bearings (E) and (F) in Fig. 3 are now cut out from some fairly stout metal. One bearing will need to be rather taller than the other and they are made so the axle which will be passed through the holes lies centrally between the magnet poles. Final adjustments may be made by shaving a little off the baseboard or inserting packing under the bearings, if necessary.

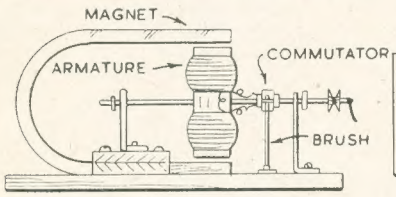


Fig. 1—Side view of the motor

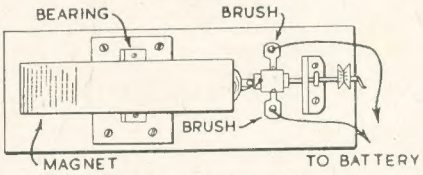


Fig. 2—Top view showing brushes, etc.

Axle and Armature

A length of steel knitting-needle is, perhaps, best for the axle. To avoid drilling, the armature can be made up from two pieces of iron, as shown at (D), Fig. 3. Small grooves are filed across the inner faces of these pieces so when the axle is placed in these grooves and the two pieces bound with thread, the whole is secure. If desired, solder may be added.

Get the armature to balance nicely, filing a little away from one end if necessary. Its overall length should be such that it will turn between the magnet poles without touching them.

Take a length of insulated wire and wind half on one pole. Afterwards take the wire across to the other armature pole and wind the remainder on, as shown in Fig. 1. All turns must be in the same direction. For a 4·5 volt battery, something around 26 S.W.G. wire is best.

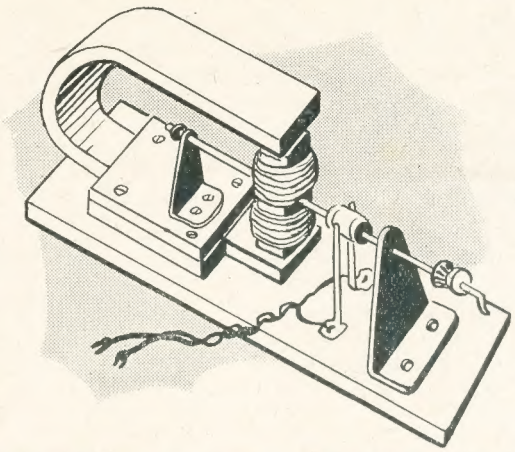
For extra power (but increased battery consumption) use 22 or 24 S.W.G. wire. For very economical running, with a reduction in power thinner wire (about 30 S.W.G.) can be used. The more turns of any wire put on, the lower will the current drain be.

The commutator consists of an insulated centre piece with two small segments of metal, and is shown at (A) and (B) in Fig. 3. Wood, ebonite tubing, or glued tape can be used for the centre. The segments can be bent from a little brass or tin, or a small piece of copper or brass tubing can be sawn in two. The segments are held in place by binding tightly with glued thread, and the commutator is a tight push fit on the axle.

Join the beginning of the armature winding to one segment, and the ending to the other. Soldering is the simplest method.

The brushes consist of thin metal strips, cut as shown at (C) and screwed to the baseboard. They should bear *lightly* on the commutator, running between the securing threads. From the screws holding them take two flexible leads to connect to the battery.

End-play of the axle is prevented by washers soldered on. Turn the armature so that its ends are opposite the poles of the magnet and—holding it in this position—turn the commutator on the axle so the segments are just breaking contact with the brushes. The best running position can easily be found by turning the commutator a few degrees one way or the other.



The motor should run at high speed and without undue vibration. The windings may be varnished to hold them secure. Reversing the battery connections will make the motor run in the opposite direction. Good results should be obtained immediately and final adjustments of the brushes and commutator can afterwards be made.

When the motor is used in a boat the easiest method of driving the propeller is shown in Fig. 4. A small finger projects at the end of the motor axle, and this engages with a small crank on the propeller spindle. This operates satisfactorily even if the spindles are not in line.

So that water cannot come up into the boat the propeller spindle passes down a small metal tube, which is glued in a hole in the bottom of the boat. As the top of this tube is above the water level water cannot come in, even if the spindle is a loose fit, as it should be.

Stout wire, carefully straightened, will do for the spindle and propellers may easily be cut from tin. A small one about 1in. in diameter, with two or three blades, is probably best. Twist the blades slightly so that the boat is driven forwards when the motor is running.

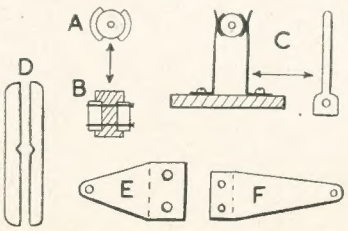


Fig. 3—Armature, commutator, etc.

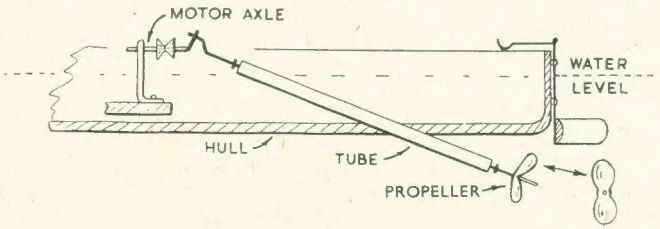


Fig. 4—Section showing arrangement of propeller drive

Model Railwaymen will be interested to make

SMALL STATION SIGNALS

SIGNALLING on even the most simple model railway layout, is a very interesting operation, and, providing proper prototype practice is followed, there is no limit to which realistic train working can be carried out to the proper signal indications.

The decision as to whether the finer details of prototype signalling, or a simple skeleton system is carried out, depends largely upon the amount of time—and money—the reader is able to devote to achieving his ideal.

Common Layout

In Fig. 1 is depicted the track layout of a simple through station such as will be found by the hundred all over the Country, either as shown, or slightly modified or reduced in siding capacity. Very frequently only a single siding may be found on either the up or down road, or, perhaps, there may be both an up and a down siding. The type is largely determined by the class of merchandise generally handled and also by the amount of land available.

In the diagram two sidings are shown on each road so that the disposition of the appropriate signals may be lucidly explained.

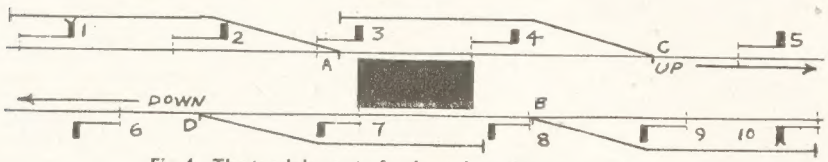


Fig. 1—The track lay-out of a through station of usual type

Taking the signals in numerical order, No. 1 is the 'up' distant, No. 2 the 'up' outer home, No. 3 the 'up' inner home, No. 4 the 'up' starter and No. 5 the 'up' advanced starter. On the 'down' road, No. 10 is the 'down' distant, No. 9 the 'down' outer home, No. 8 the 'down' inner home, No. 7 the 'down' starter and No. 6 the 'down' advanced starter. The four siding points are lettered A, B, C and D.

Operation Example

As an example of train operation on the 'up' line, signal No. 1 can only be pulled off when No. 2 is off, whilst Nos. 3 and 4 are workable independent of each other and of Nos. 2 or 1. Nos. 4 and 5 are also individually operative.

Signal No. 2, however, is interlocked so it cannot be pulled off if the points at 'A' are set to the siding. Similarly signal No. 4 is locked with points 'C', though shunting operations may be made past signal No. 4 and point 'C', up to signal No. 5; which remains at danger, or 'on'. A train which has been drawn ahead, past the starter signal, up to the advanced starter, may then be backed into the siding *via* point C; without having to be signalled into the next 'block' ahead.

General Running

Similarly a train may be drawn past signal No. 2, and up to No. 3 before being backed into the other 'up' siding *via* point A. Both the 'down' sidings are entered and left in the same manner, and it will be observed that no siding can be entered other than by backing against the normal direction of the main-line traffic nor can a siding be left by a train in any other direction than that of the traffic on the main-line.

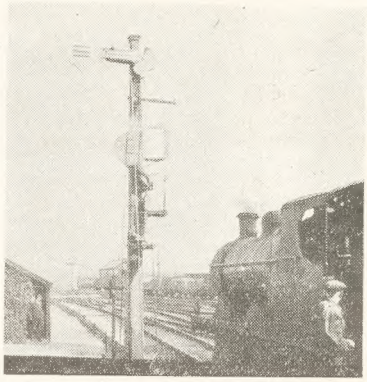
This direction of entry and exit from sidings is very important, the main reason being that, by being arranged as depicted in Fig. 1, there are no facing points on either 'up' or 'down' main line; so it is impossible for a through train to be inadvertantly switched into a siding dead-end.

To make the goods working at the station more effective, and to give transfer facilities from 'up' to 'down' sidings, and *vice versa*, it will be necessary to add a crossover road from approximately point 'D' to 'A', and/or from 'B' to 'C'.

Triple Points

If triple points are available, these could combine the crossover and siding switches, but failing this the crossovers should be placed so the points are located between 'C' and signal No. 5, and between 'B' and signal No. 9. At the other end of the station the crossover points should be located between 'D' and signal No. 6, and 'A' and No. 2; in both instances these additions are shown by dotted lines.

By interlocking 'A' with No. 2, 'B' with No. 9, 'C' with No. 4 and 'D' with No. 7, no derailments can take place if the trains are duly run according to the signals; which is, of course, the right procedure.



In prototype practice it is usual to have all points diverging from, or converging into the main-lines indicated by appropriate ground signals, the latter, in model form, could be arranged to go 'off' when the points are set for the siding concerned.

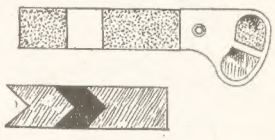


Fig. 2—Full size diagram of 'O' Gauge arms

Signal Arms

In Fig. 2 are shown M standard lower quadrant arms, which are drawn full-size for 'O' gauge. The left-hand arm (with the spectacle) is painted red (dotted) with a white band, whilst the other is yellow, with a black band. In both cases the spectacle housing and pivot point (shown white) is painted black.

The red arm is used for signals Nos. 2, 3, 4, 5, 6, 7, 8 and 9; whilst the yellow fish-tailed arm is used for the distant signals Nos. 1 and 10.

The method of making these signals in 'O' gauge has already been described fully in this series of articles, and appeared in *Hobbies Weekly* of about October, 1948). (227)

You can make a lasting joy for a youngster with this

PULL-ALONG TROLLEY

HERE is an attractive little pull-along cart, just the thing to make for one of the youngsters. It is strongly made and comparatively simple in construction and finish. Another point, too, and one that is at present most important, it can be made from any sort of wood from ½in. thick to ⅝in., whichever is available.

The boards from which the parts are to be cut need not be very wide, in fact, ordinary pieces of floor board about 6ins. or 7ins. wide might well be used, as they can be planed up and glue-jointed to get the wanted widths.

The Floor First

Our illustration, Fig. 1, gives a good idea of how the cart will look when finished and painted. These are two sides, a floor and the front and back board. In Fig. 2 the dotted lines denote the positions of these in relation to the sides.

Make the floor first, and cut off two pieces 16ins. long and 6ins. wide. Plane the edges and make a glued joint and finish the width to 10ins. Stiffen the floor by nailing across two ⅞in. pieces 11ins. long by 2ins. wide. These form the bearers for the wheels, which will later be attached by round-head screws with thin washers each side.

Now make the two sides, and from the squared diagram, Fig. 3, the correct outline of one of these can be drawn, the squares being 1in. sided. The outline of the rabbit can also be obtained from this diagram when the time comes for reproducing it in paint on the wood.

Make the outline of the side and that of the rabbit on a sheet of light brown paper, the squares being drawn in with a faint line just sufficient to be able to see them and follow them through. The inner detail of the rabbit should be included so this can, later on, be transferred to the sides for painting.

Two pieces of wood should be joined for each side and after the shaping has been done with the fretsaw, the edges, except the lower edges which join with the floor, must be rounded and made smooth with coarse and fine glasspaper.

The front and the back boards of the cart can next be made, and here again two pieces of ⅜in. or ⅞in. wood is jointed up. The length of the pieces is 10ins., and the width 12ins. and 10½ins., respectively. Round off the top edges of the pieces after trimming them down to the correct widths.

Front and Back

The position of the front and back board having been drawn on the pattern of the sides according to the dotted lines in Fig. 3, the holes for the screws or nails can be bored and the sides then attached easily. First lay the edges of the front and back boards in line with the dotted lines and the hole positions marked on the thickness of them. Plane off the ends of the floor to a slight chamfer so it will drop down and fit against the front and back boards and flush up against the sides where it can be nailed or screwed.

All the woodwork may now be cleaned with glasspaper and given two coats of paint, or one coat of paint and one of enamel. Keep the colours bright and attractive.

In the detail, Fig. 4, is shown how a strong joint may be made between the uprights and the sides of the cart. Tenons are cut as shown and corresponding mortises made in the sides. When all is glued up a much firmer joint results than if made with screws or nails. All the tenons and mortises need to be carefully marked out before the cutting is done, as a tight fit is absolutely essential.

The picture of the rabbit may be transferred to the painted side by means of carbon paper. Remember that the head of the rabbits must face the same way, that is towards the front, in each case. As far as possible use natural colours for the rabbits, and get depth of tone by light and heavy shades of brown.

Wheels from 3ins. to 5ins. in diameter may be put on the cart and stout round-head screws used as fixing. Put metal washers each side of the wheels as previously suggested, and a touch of oil on each for smooth running. A stout cord with cross hand bar will finish the job.

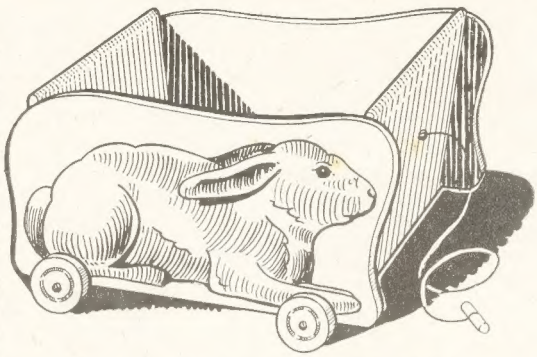


Fig. 1—A simple truck with painted animal

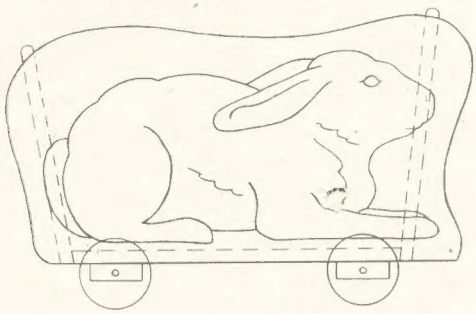


Fig. 2—Side view with dotted lines of truck parts

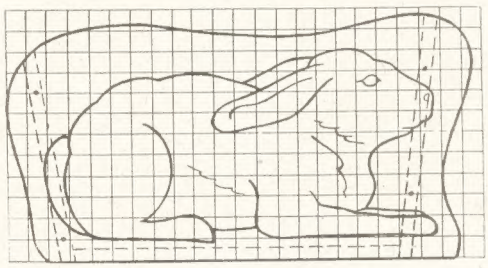


Fig. 3—Squared outline of side and rabbit shape

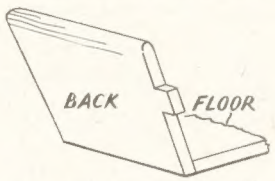
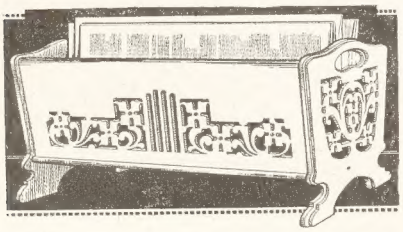


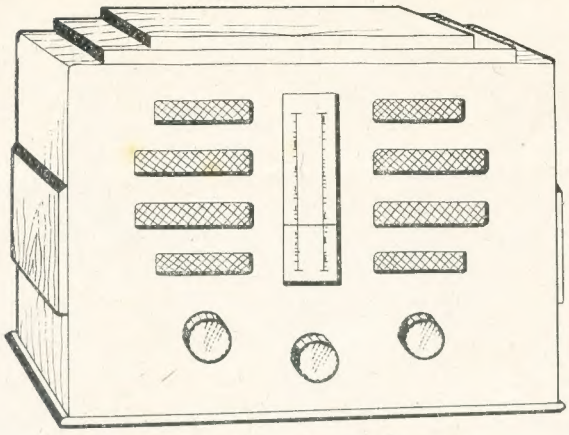
Fig. 4—Slope of back with tenon

Our Gift Design

This Newspaper Stand is made from our free design and Kit No. 2860, obtainable from Hobbies Branches for 9/5 or post free 10/2, Hobbies Ltd., Dereham, Norfolk.



Constructing a moving type scale for a set with a CORD-DRIVE TUNING DIAL



Suggested design for a modern type of cabinet

A MODERN type of tuning dial with a vertical or horizontal tuning scale is quite easy to construct and will improve the appearance of many home-made receivers. The usual way in which such dials work is shown in Fig. 1. The position of the tuning knob spindle will depend upon the layout of the controls, as will the shape and size of the tuning scale, but the method of construction remains essentially the same.

Tuning Scale

After deciding whether this is to be vertical or horizontal, determine the approximate distance it is desired the pointer should move. This may depend upon the cabinet design; an average movement is about 4ins. but this will be less for a small set and larger in some big receivers. A scale about 4ins. long gives ample space for the station names to be indicated.

Multiply the scale length by two, and divide by 3¼th. This will give the diameter of the drum necessary to move the pointer over the length of the scale when the tuning condenser makes its customary 180 degrees rotation.

Alternatively, the length of the scale may be made to suit the drum, the pointer movement equalling half the circumference of the latter. About ¼in. free space is left at both ends of the scale so the rectangular window cut in the cabinet should be this much larger.

Drum Drive

A stout tin lid can be used for the drum with a bush with ¼in. diameter central hole soldered to it. The drum should be about ½in. wide to assure the cord does not come off and two small holes should be drilled in its rim and their edges filed smooth. The ends of the cord pass through these, as shown at (A) in Fig. 2.

The tuning knob spindle has a wheel about ¼in. in diameter and is pivoted in a strong bracket. These parts can be devised quite easily from oddments which may be to hand, or can be bought cheaply, as can the tuning drum, if desired. The relative sizes of the wheels will govern the reduction ratio, of course, and a ratio of between about 5:1 and 10:1 is usual, though other ratios are satisfactory.

Cord Drive

After the tuning condenser and knob spindle have been mounted in convenient positions on the front of the receiver panel, or on a rectangular piece of 3-ply bolted to the receiver chassis, the small wheels guiding the cord should be added. These will be placed so that the cord is run straight along the edge of the scale, and are pivoted on small bolts. The latter should have nuts locked tightly against each side of the panel.

The cord is now passed through one of the holes in the drum and several knots made. It is then taken to the tuning knob wheel and given a complete turn round this. From there it goes over the pulleys and round the drum. The end is passed through the second hole and tied to a fairly strong tension spring, which is stretched a little and hooked on to a small bolt projecting inside the drum, as shown in Fig. 2. This takes up any slack in the cord and assures that the drive will work indefinitely without attention.

For the cord, thin, good-quality string can be used, or stout fishing line. Tighten up the bush set-screw, assuring that the condenser can move to the fullest extent each way without the points where the cord is fixed being reached in the unwinding process which takes place as the drum is turned.

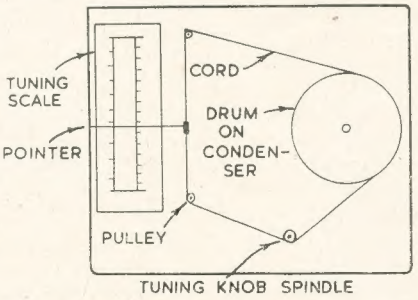


Fig. 1—Front view of mechanism

Pointer and Scale

The pointer is shown at (C) in Fig. 2 and consists of a stout, straight brass or tinned-copper wire soldered to a small piece of tin. The latter is bent double with pliers and nipped on to the cord. If a very accurate type of pointer is wanted, a narrow strip of celluloid with a hair-line scored down its centre can be used.

The tuning scale is cut from stout paper or thin card and drawn up according to the wavebands in use. Different colours are normally used for the different wavebands, e.g., red, green and black for Long, Medium, and Short Waves.

Stations can be marked by tuning them in accurately and then marking the scale, and if this is done carefully the result will be much more exact than with mass-produced commercial receivers. The wavelengths between stations can be filled in by dividing the scale equally, or a wavelength graph can be drawn.

Cabinet Details

Such a dial can be made to suit almost any cabinet, and the illustration shows a type of cabinet which is easy to make, yet which has a good modern appearance. When the receiver is pushed in from the back the scale comes up behind a suitable rectangular cut-out, and the control spindles project through fairly large clearance holes in the cabinet front.

The speaker fret is cut both sides to obtain a balanced appearance, but the speaker itself is situated at one side only. If the drive is made up as shown in Fig. 1, the tuning condenser will come behind the right-hand section of the fret, and the speaker can be secured at the left-hand side.

Speaker fabric or similar material is glued over the frets on the inside and to obtain a proper finish the scale rectangle should be covered on the inside by means of celluloid or glass glued or screwed in position. If a strip of glass is cut four small screws with cardboard or fibre washers under their heads will hold it securely. The pointer should extend completely across this 'window' and the method of operating will, of course, be unseen.

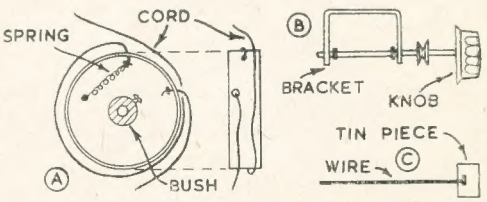


Fig. 2—Details of controls

The first of a practical series for the amateur on

BOOKBINDING

IT is always a problem to know what to do with the numerous booklets which accumulate in every household. Books like the Highway Code are always worth keeping, yet invariably become tattered and neglected. If they are kept in the bookcase, they rapidly get 'dogeared' and untidy and sooner or later make their way into the dustbin when spring cleaning fever invades the home.

These books are bound to suffer this fate since they are usually only staple-bound in flimsy paper covers which fall off at the least provocation. The method of binding here described solves the difficulty since it enables the discerning handyman to bind such material into permanent stiff boards, making useful and handsome additions to the bookcase.

Method and Preparation

The book is first stripped of its wire staples. If there is none, and the booklet was originally machine sewn, it is advantageous to leave this intact during ones first attempt at binding. Later when practice has given confidence, this sewing should be removed for subsequent attempts.

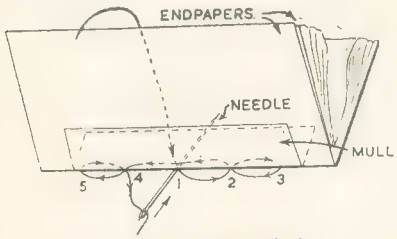


Fig. 1—The five-hole stitch

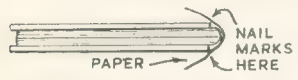


Fig. 3—Measuring round the spine

The book is opened flat, and two sheets of cartridge paper are cut out to the exact size of the whole covers. These sheets are folded at the centre and placed over the original cover as if to form two additional ones. If the original cover contains no information relevant to the book and is full of advertisements only, it should be removed and discarded. If it has an attractive picture or design, however, or contains necessary information, it should be left in its place.

End Papers

The cartridge papers are to form end papers for the new binding and should be kept quite clean during the ensuing operations. The outside of the outer one will later be pasted down and it will not matter if this becomes a trifle grubby.

It is now necessary to make a hinge upon which the boards will be pasted. This is best made of bookbinders' mull pasted to cartridge for strength. If mull is not obtainable, a piece of 3in. bandage will suffice, or alternatively, butter muslin or ballet muslin will do.

The size of the hinge depends on the size of the book, but it should be about 1½ins. shorter than the book and at least 3ins. wide. A glance at diagram (A) will show how to check the size.

Sewing

The dry hinge is folded over the spine, as indicated in Fig. 1 and the booklet is sewn with strong white linen thread. A darning needle is suitable if bookbinders' needles are not at hand. A five-hole stitch is used, and as far as possible any existing stitch holes should be used again for neatness. The diagram at Fig. 1 shows the stitches in detail and the reader will notice that the ends of the thread meet at the centre inside the booklet.

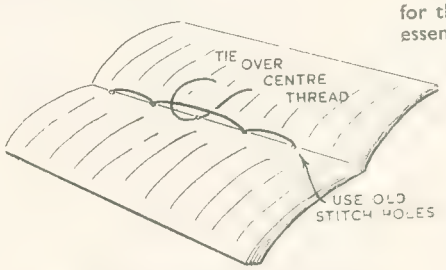


Fig. 2—Tying inside the book

These ends are tied together carefully in a tight reef-knot, care being taken to pull in any slack thread first. It is most important that the ends are tied over the top of the length of thread which passes across the centre hole inside the book, as shown in Fig. 2. This will prevent the knot slipping through the hole to the outside with a consequent looseness in the thread.

The drawing at Fig. 3 shows the sizes of the boards relative to the book. Two boards are cut from cardboard about $\frac{1}{16}$in. thick, the same width as the book, but $\frac{1}{4}$in. longer.

The boards are pasted to the hinges to fit, as shown in the detail and allowing $\frac{1}{8}$in. overlap at top, bottom, and fore-edge. The $\frac{1}{8}$in. at the fore-edge is obtained by placing the boards $\frac{1}{8}$in. off the spine. Before placing the book in a press to dry, a few measurements are taken to facilitate the measuring of the cloth used for covering.

Measure the overall length and width (open) of the book and also the distance around the spine from board to board. The best method is to take a piece of newspaper and fold it around the spine, marking the edges of the boards upon it with the thumb nail. Take the paper off and measure across the two marks (see Fig. 4).

A piece of cartridge is cut to this width and to the length of the spine. This will serve to strengthen the cloth at its weakest point, i.e., the spine.

Cutting and Measuring the Cloth

The cloth is measured to the size indicated in Fig. 5. Remember to allow for the distance around the spine. It is essential, too, that the $\frac{3}{4}$in. overlap all around, shown in the diagram, be allowed for also. This will be used for folding in when the cloth is pasted on. The measurement formula for the cloth is:—Length equals length of book plus 1½ins.

Width equals width of open book plus 1½ins. plus width around spine.

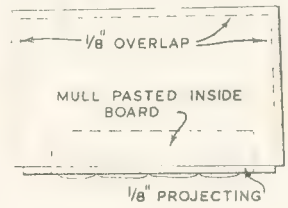


Fig. 3—Fitting the boards

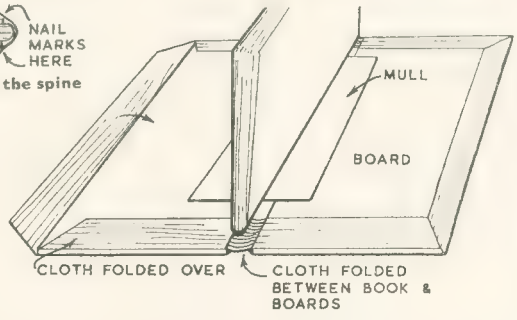


Fig. 6—Folding in the cloth overlap

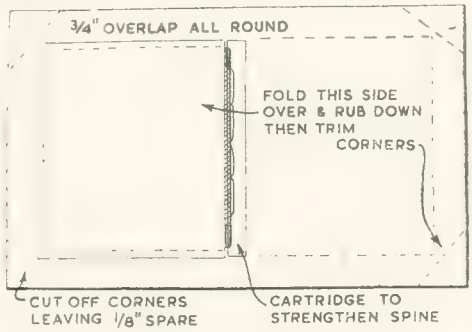


Fig. 5—Pasting cloth and trimming corners

Covering

When the book is removed from its

(*Continued foot of page* 333)

A PHOTOGRAPHIC ALPHABET

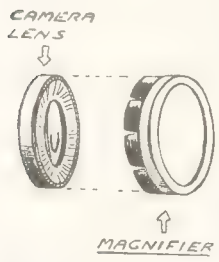
The amateur photographer finds these short notes most helpful, as full of practical knowledge, and helpful hints. We shall complete the whole range of letters from A to Z

M for—

MAGNIFIERS

BOX and other 'fixed-foxus' cameras seldom allow of items being nearer than 10ft. or 15ft., as within this range everything is fuzzy. This means that with these instruments as they are, you can never take 'head and shoulder' pictures or attempt small subjects like dogs or cats.

By means of an extra lens known as a magnifier, however, the trouble can be overcome. A magnifier is a simple piece of glass, not unlike one of the eye-pieces of a very weak pair of spectacles and it is clipped on in front of the ordinary lens. The effect of the attachment is to bring things up to about 3ft. away into sharp definition with all the advantage of this shorter range.

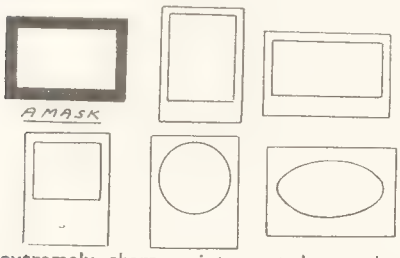


A Magnifier is not expensive to buy, costing only a few shillings and is such a thin piece of glass that it does not increase the length of exposures. It is quite worth getting and greatly increases the scope of any fixed-focus camera.

MASKS

MOST snaps you get from the chemist are surrounded by a thin white border. This is produced by a thin but opaque frame placed between the negative and sensitive paper while printing. This frame is known as a 'mask'.

Masks are sometimes made of thin celluloid but can be quite well cut from the thinner varieties of black paper found round plates. In cutting a mask an extremely sharp point must be used (say, the sharpened tip of a pen-knife blade) and care must be taken to cut just up to and not beyond the corners. A steel edge should be used for the purpose and the desired shape lightly pencilled in before starting.



We have become so accustomed to the thin white border of the commercially finished print that the art of beneficial masking as used some years ago seems to have become lost. Actually most pictures have a definite shape in which they look best, some suiting a circular surround, others an oval, etc. Most pictures look better masked, so that there is a broader white band at the bottom than the top—a masking which is commonly used on the Continent, but not here.

A major use of a mask is to delete parts of a picture not required and to concentrate interest on the more important items. Indeed, with care a mask can turn a poorly exposed picture into a pleasing effort.

'M Q'

WHEN you remove a film from the camera after the snaps have been taken it looks exactly as it did when put in—not the least sign of a picture anywhere. To bring up the image (i.e., to make it visible) the film has to be placed in a solution known as a 'developer'. There are literally scores of kinds of developers about, each of which has some special characteristic, but the most all-round one for amateurs to use is known everywhere as 'MQ'.

The 'M' stands for 'Metol', the 'Q' for 'Quinol' and it is recognised as the best balanced formula for general work. It can be bought in fourpenny packets from any chemist and can be used to develop films, plates, gaslight paper or bromide paper. For plate and film and bromide paper the powders in the packet are dissolved in 10ozs. of water, but only 4ozs. of water are needed for gaslight.

Practically all the main photographic manufacturers turn out an 'MQ' developer of their own, but invariably the letters 'M' and 'Q' are shown big on the front of the packets.

N for—

Negative

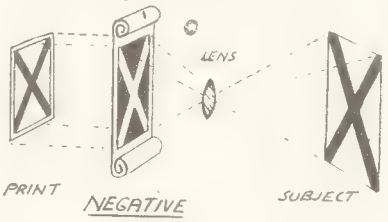
ONE of the most important things in photography is the negative. As described in an earlier paragraph, the film we put in the camera is coated with a light-sensitive emulsion. That is to say it is affected at any point in a manner directly proportional to the *amount* of light falling on that point.

The lens throws a picture of the subject on this sensitive surface which is then recorded by the relative areas of light and shade.

The action of the light is to make the emulsion capable of becoming black in a 'developer' and the more light within certain limits, the blacker it will go. Hence the image is recorded in *reverse*, areas of high light showing up black and dark areas where there has been little action, remaining light.

This, then, is the negative.

Fortunately, the situation can be changed by putting a similarly sensitised sheet of paper behind this reversed rendering and exposing once more to light. Again the areas receiving the most light go the darkest, but a moment's thought will show that as the light is coming through the negative everything will be turned round once more—which is what we want—and so a *positive* print obtained.



O for—

Over Exposure

THIS is a fairly common negative fault at the present time with the very fast films there are about, and also it is a common error of amateurs making their first time exposures.

Over exposure means that light has been let play for a too long time on a plate,or film.

Now you might think that as the picture is made by the action of light on the sensitive layer of the roll, the more light the better the picture.

Up to the point of correct exposure, additional light does give a richer impression, but beyond this point it has the reverse effect. More light then cancels out contrast and makes the picture flat. Too much over-exposure and the picture becomes almost a ghost image only—at the same time the negative being thick and heavy—or with some materials, blackening right in.

Over-exposure then can be identified from other faults by heaviness and flatness. To ensure the correct exposure a chart should always be used, especially if time exposures are being attempted.

If you are developing your own film, and by the way, the picture shoots up and blackens in, you can see it is over exposed, the thing is to keep on developing for longer than the correct time. The negative will be very black, but by this means you may get enough contrast to obtain a passable print.

A novel Cigarette Box made as an old-time TREASURE CHEST

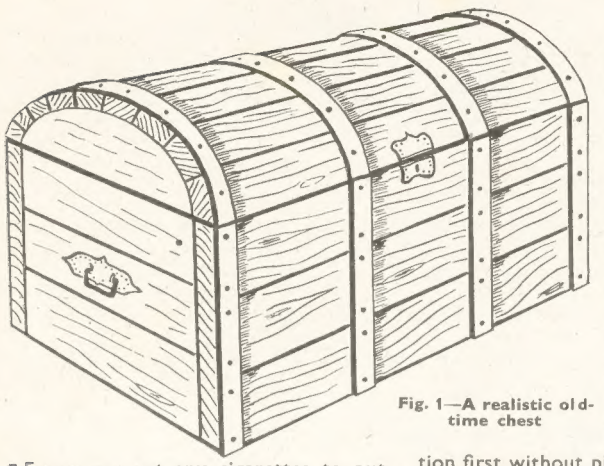


Fig. 1—A realistic old-time chest

IF you can get any cigarettes to put inside, the box illustrated at Fig. 1, is just the thing for the sideboard or mantelpiece. It is novel, attractive and useful, and is not difficult to construct. The total amount of wood used is small, and any odd pieces can be brought into service.

As the wood to be used is only ¼in. thick, it should be of a kind that is not liable to split easily, when nailed. Oak is excellent for the purpose.

Make the body first, joining the back, front and two sides with panel pins. Fig. 2 shows the plan of the body. Next fix on the base, which should be a true rectangle, otherwise the shape of the chest will not be correct. When cutting out the base, leave sufficient wood for planing off.

Lid Construction

Now construct the lid. First cut out the two end pieces with a fretsaw, to the shape shown in Fig. 3. Along the top of these side pieces have to be nailed ½in. wide strips of wood, in order to obtain a curved surface, and to give a realistic chest construction. The strips are all 5½ins. long.

Start by nailing one of the strips to the back and one to the front, at the lowest part. Then test the lid on the body to make sure of a perfect fit.

Each strip of wood for the top should be slightly wedge shaped, and fitted so that the tops come flush with each other. Fig. 3 is an end view of the lid, making the construction quite clear. It is advisable to shape all the strips, and fix them in position first without pinning. With careful work with plane and glasspaper a tight fit can be obtained. File the edges, then fill in the spaces between the strips and the side pieces with plastic wood.

Fixing Top

Next fix the top to the body with hinges, using extra small hinges and screws. This is an operation requiring precision, and the services of an assistant will be required. Sink the hinges in recesses cut in the lid and the body, but take care not to cut the recesses too deeply or the hinges will pull and soon become loose.

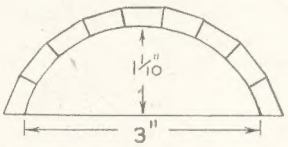


Fig. 3—End of top

To give the effect of 'plank' construction to the body, make straight cuts across it, in the places shown in Fig. 1. Use a marking knife or similar tool.

Now, all the best treasure chests are metal bound, and have locks and handles. For the metal bands, cut strips of thin metal ½in. wide. Brass or copper is best, but tinplate will give quite a good effect if you coat it with black lacquer after fixing. An old pair of scissors comes in useful for cutting thin metal, if you have not proper shears, or you can use a metal fretsaw blade.

Pin these strips of metal along the chest in the positions shown, making holes for the pins previously. Do not forget to do the back as well.

Picture Lock

Next cut out the imitation lock, as in Fig. 1. Make the key-hole, using a drill and file, and fix on. Small sized cobbler's brads are ideal for pinning on these metal parts. For the handles, cut out the two plates, then make recesses for the wire by bending the plates over a nail of suitable thickness.

To prevent the lid from falling too far back and so injuring the hinges, use a small length of tape, attaching one end to the lid with a drawing pin, the other end to the body. Finish off by glasspapering all over, lacquer the metal parts if necessary, and stain the wood. (202)

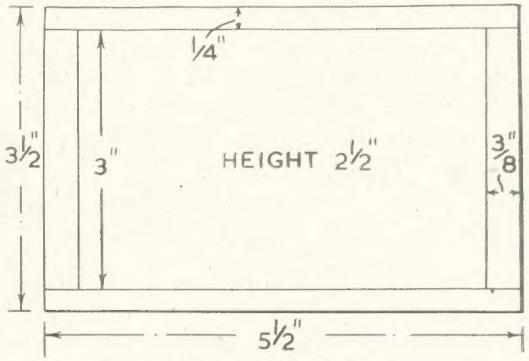


Fig. 1—Plan of chest sides

Bookbinding—(*Continued from page* 331)

press for covering, a glance inside the boards is needed to ensure that the endpapers have not adhered to any paste squeezed past the hinges. If this has happened the endpapers must be carefully freed. The cloth is then laid out flat and pasted all over. Do not cut off the corners yet.

The spine strengthening piece of cartridge is placed centrally and the book placed flat on one side of the cloth so the spine lies adjacent to and over the centre piece, as seen in Fig. 5. The book is firmly pressed into position and the opposite half of the cloth turned over to rest in position on the top of the book. A rub down each side with a clean piece of rag is necessary to ensure that all air bubbles between the boards and the cloth are removed.

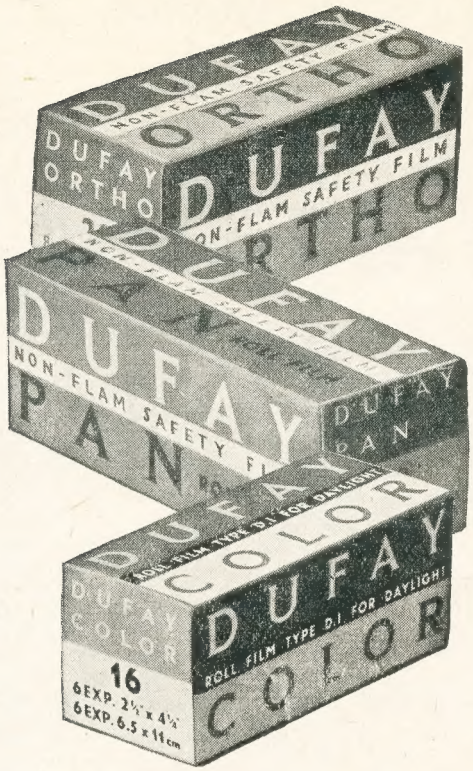
The cloth may now be trimmed at the four corners across-wise (shown in Fig. 5) cut to leave ⅛in. cloth spare at each corner of the boards. The overlapping cloth edges are now folded in and pressed on to the insides of the boards, as shown in Fig. 6.

The Endpapers

The first sheet in the book is now pasted down to the inside of the front board so as to hide all but a neat ⅛in. border of cloth on the inside. If the sheet is pasted first and the cover is allowed to close, the endpaper will fall automatically into the correct position and will merely require smoothing with a clean piece of rag to exclude air bubbles or creases. The operation is then repeated with the last sheet in the book and the back cover.

The book is now complete but must be placed in a press to prevent any warping. When it is dry in all respects it is removed and the final touches are added simply by neatly printing the title on the cloth spine in a suitably coloured waterproof ink.

A further article will deal with other aspects of Bookbinding, of particular interest to the handyman. (196)



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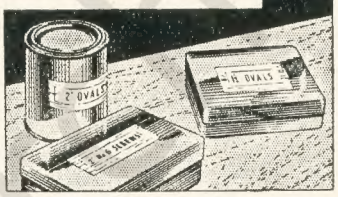

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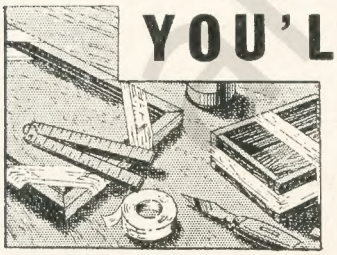

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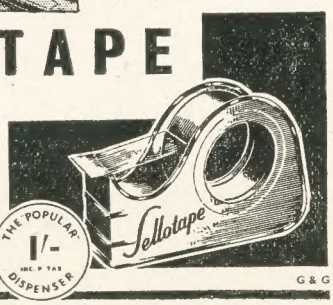

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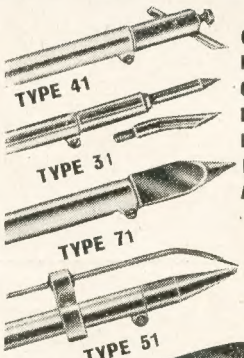

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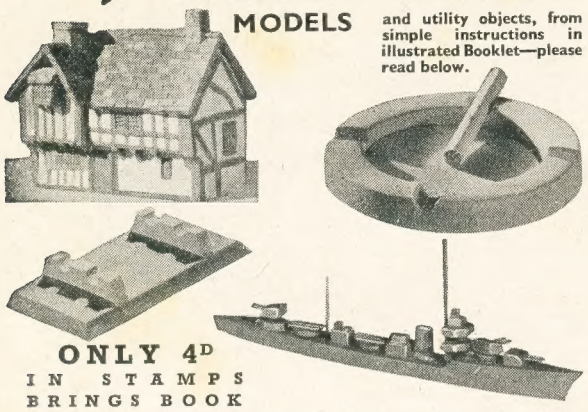

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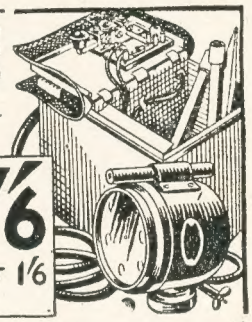

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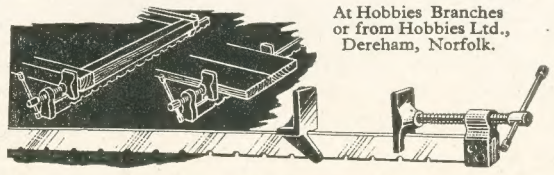
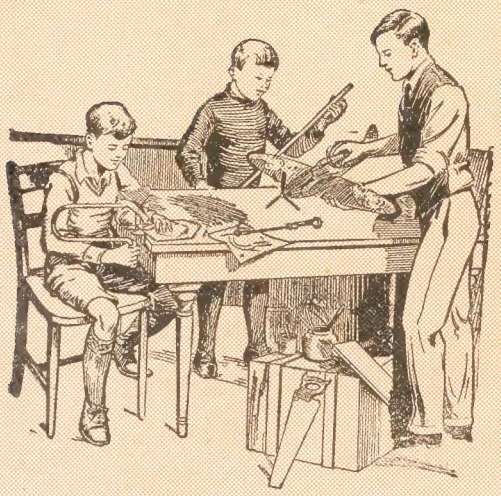


At Hobbies Branches or from Hobbies Ltd., Dereham, Norfolk.



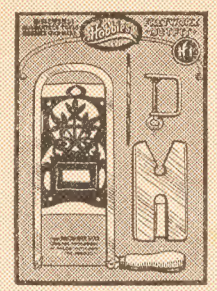
Hobbies Tools are a helping hand to happiness.

When you get down to making things in wood you enjoy a pastime to cut out worries. Think of the useful and attractive things you can make, from Hobbies own designs or practical things for the home. Any of these popular Outfits will provide the tools you need, so you can start right away. Each contains tools of good quality, design and wood for you to commence, and complete instructions to tell you how. These Outfits are obtainable at leading stores and ironmongers everywhere. Or Hobbies own Branches. By post from Hobbies Ltd., Dereham, Norfolk.

HOBBIES

BRITISH FRETWORK OUTFITS

Each contains all you need to make a start. The tools are of high quality material, and instructions provided how to use them. Either is a set you can be proud to buy or give. On coloured cards 14¼ins. by 19¾ins.



These tools are all mounted on strong cards in bright colours, making a striking outfit. Each tool is of Hobbies' high quality and each set contains sufficient to make a start. For those who cannot afford the boxed outfits, these are of really sound value.

The H3 Outfit

On larger card with extra tools. Set includes 12in. frame and spare blades, fretwork, drill and point, cutting table and cramp, 6in. steel rule, design and working instructions.

12/6 *Postage 10d.*

The NELSON Outfit

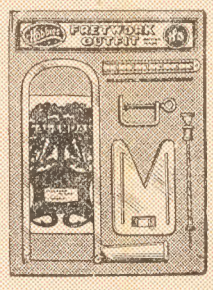
A handframe, a polished steel cutting table with cramp, an archimedean drill with bit, a glasspaper block, spare sawblades, hammer, 6in. rule, wood and design for a model.

17/6 *Postage 10d.*

The H2 Outfit

A useful range for the beginner. Includes 12in. frame and saw, cutting table and cramp, fretwork bradawl and spare blades, designs and instructions.

9/- *Postage 9d.*

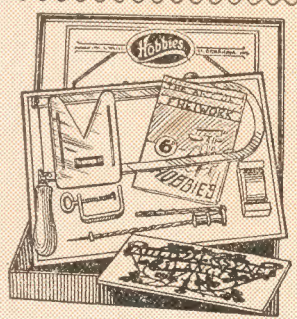


The ENSIGN Outfit

An 11in. handframe, drill with bit, a small wood-handled hammer, polished cutting table with cramp, spare sawblades, wood and design for a model.

15/6 *Postage 10d.*

TOOLS WHICH REALLY DO THEIR JOB



The CROWN Outfit
(Illustrated)

With useful small handframe, spare saws, cutting table, drill, instruction book, glasspaper block, wood and design.

16/6 *Postage 10d.*

The NATIONAL Outfit

With special comfortable grip handframe, spare saws, cutting table, drill, glasspaper and holder, wood, designs and instruction book.

23/6 *Postage 1/-*

The Popular A1 Outfit

The set most beginners demand. Lever handframe, with special saw tension device. Wide range of tools, wood, designs and 64-page instruction handbook. In deep box 15ins. square.

29/-

Postage 1/2

Also the **A3 Set**, the best of all, with even wider and better range of tools for

52/6 *Postage 1/5*

For Toymaking - Model Making - Puzzles - Fretwork - Light Woodwork - Metalwork

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